

Virginia Water Reuse Regulatory Experience

May 9, 2007



Regulation of water reclamation and reuse in Virginia

- **Currently, there are no guidelines or adopted regulations for water reclamation and reuse in Virginia**
- **Land treatment projects authorized under VPA permits or VPDES permits where discharge is available as alternative method of disposal**
- **Some industrial reuse in Virginia has not been regulated at all**

Principle factors driving water reclamation and reuse in the U.S.

- ❑ Rapid growth rate in urban areas**
- ❑ Alternative to effluent point source discharges**

(EPA Guidelines for Water Reuse, 2004)

Foundation for Virginia Water Reclamation and Reuse Regulation

- **House Joint Resolution No. 662 (1999)**
- **House Document No. 92 (2000)**
- **HB 1282 and amendments to State Water Control Law - § § 62.1-44.2, 62.1-44.3 and 62.1-44.15 (2000)**

Basis for regulation provided in State Water Control Law

- **§ 62.1-44.2 – defines purpose of SWC Law to, among other things:**
 - Promote and encourage the reclamation and reuse of wastewater
 - Protect the environment and public health
- **§ 62.1-44.15:15 – Makes it the duty of and gives authority to the SWC Board to promote and establish requirements for the reclamation and reuse of wastewater that are protective of state waters and public health as an alternative to directly discharging pollutants into state waters.**
- **§ 61.1-44.19. 12-19 – Chesapeake Bay Watershed Nutrient Credit Exchange Program:**
 - Requires the development of a general VPDES permit that will regulate total N and P discharges and provides a nutrient trading mechanism within the Chesapeake Bay watershed of Virginia
 - Identifies recycle or reuse of wastewater as a means of reducing total N and P loads, comparable to “Biological nutrient removal technology”

Water Reclamation and Reuse Regulation

- ❑ **Part I - Definitions and General Program Requirements**
- ❑ **Part II - Reclaimed Water Standards, Monitoring Requirements and Reuses**
- ❑ **Part III - Application and Technical Requirements**

Water Reclamation and Reuse Regulation

9 VAC 25-740-10 Definitions

Water Reclamation – the treatment of domestic, municipal or **industrial** wastewater or sewage to produce reclaimed water for a water reuse that would not otherwise occur

Reuse or Water Reuse – the use of reclaimed water for a direct beneficial use, an indirect potable reuse, or a controlled use in accordance with this regulation

Water Reclamation and Reuse Regulation

9 VAC 25-740-50.A Exclusions

- Activities permitted by VDH
- Utilization of gray water
- Non-potable water produced and utilized by the same treatment works (other qualifying factors)
- Recycle flows within treatment works
- Industrial effluents or other water streams prior to final treatment used in re-circulation, recycle or reuse systems at the same industrial facility (other qualifying factors)
- **Land treatment systems defined by SCAT Regs**
- Indirect reuse excluding indirect potable reuse projects after effective date of regulation
- Existing indirect potable reuse projects
- **Direct injection of reclaimed water into an aquifer authorized by UIC permit issued by EPA**

Water Reclamation and Reuse Regulation

9 VAC 25-740-70 Standards for Reclaimed Water

- **Level 1**
- **Level 2**
- **Industrial – determined on a case-by-case basis**

Water Reclamation and Reuse Regulation

Level 1 – Secondary treatment with filtration and higher level disinfection

- Monthly geometric mean for fecal coliform, E. coli or enterococci – 14/11/11 per 100 ml, respectively
- CAT for fecal coliform, E. coli or enterococci – > 49/35/24 per 100 ml, respectively
- TRC: CAT < 1 mg/l
- pH: 6-9 SU
- BOD₅: mo. ave. ≤ 10 mg/l (CBOD: mo. ave. ≤ 8 mg/l)
- Turbidity: daily ave. ≤ 2 NTU, CAT > 5 NTU

Water Reclamation and Reuse Regulation

Level 2 – Secondary treatment with standard disinfection

- Monthly geometric mean for fecal coliform, E. coli or enterococci – 200/126/35 per 100 ml, respectively
- CAT for fecal coliform, E. coli or enterococci – > 800/235/104 per 100 ml, respectively
- TRC: CAT < 1 mg/l
- pH: 6-9 SU
- BOD₅: mo. ave. ≤ 30 mg/l, max. wk. ave. 45 mg/l
(CBOD: mo. ave. ≤ 25 mg/l, max. wk. ave. 40 mg/l)
- TSS: mo. ave. ≤ 30 mg/l, max. wk. ave. 45 mg/l

Water Reclamation and Reuse Regulation

9 VAC 25-740-90.A Minimum Standard Requirements for Reuses

6 Reuse Categories

- 1. Urban - Unrestricted Access (Level 1)**
- 2. Irrigation - Unrestricted Access (Level 1)**
- 3. Irrigation - Restricted Access (Level 2)**
- 4. Landscape Impoundments (Level 1 or 2)**
- 5. Construction (Level 2)**
- 6. Industrial (Level 1 or 2)**

Water Reclamation and Reuse Regulation

Urban - Unrestricted Access (Level 1)

- **All types of landscape irrigation in public access areas (i.e., golf courses, cemeteries, public parks and athletic fields)**
- **Toilet flushing – non-residential**
- **Fire fighting or protection and fire suppression in non-residential buildings**
- **Outdoor domestic or residential reuse (i.e., lawn watering and non-commercial car washing)**
- **Commercial car washes**
- **Commercial air conditioning systems**

Water Reclamation and Reuse Regulation

Irrigation - Unrestricted Access (Level 1)

- Irrigation for any food crops not commercially processed, including crops eaten raw

Irrigation - Restricted Access (Level 2)

- Irrigation for any food crops commercially processed
- Irrigation for non-food crops and turf, including fodder, fiber and seed crops; pasture for foraging livestock; sod farms; ornamental nurseries; and silviculture

Water Reclamation and Reuse Regulation

Landscape Impoundments

- **Potential for public access or contact (Level 1)**
- **No potential for public access or contact (Level 2)**

Construction (Level 2)

- **Soil compaction**
- **Dust control**
- **Washing aggregate**
- **Making concrete**

Industrial (Level 1)

- **Commercial laundries**

Water Reclamation and Reuse Regulation

Industrial (Continued) (Level 2)

- **Livestock watering**
- **Aquaculture**
- **Stack scrubbing**
- **Street washing**
- **Boiler feed**
- **Ship ballast**
- **Once-through cooling**
- **Recirculating cooling towers**

For other reuses not listed above, Board may require specific standards and monitoring requirements

Water Reclamation and Reuse Regulation

Groundwater Recharge and Aquifer Storage & Recovery (ASR)

- **Not included among listed reuses**
- **DEQ conducting statewide groundwater characterization - needed to determine feasibility of groundwater recharge & ASR**
- **DEQ may consider in future amendments to the regulation**

Water Reclamation and Reuse Regulation

9 VAC 25-740-100 Application for permit

- General information – for reclamation systems and reclaimed water distribution systems
- Reclaimed Water Management (RWM) Plan – for provider of reclaimed water to end user or self
 - Description and map of service area
 - Inventory of reclaimed and reject water storage
 - Water balance – reclaimed water generated, stored, reused and discharged
 - Example service agreements or contracts
 - Education and notification program (Level 1)
 - Cross-connection & backflow prevention program
 - NMP requirements for irrigation reuse
 - Site plans for bulk irrigation reuse sites

Water Reclamation and Reuse Regulation

- All irrigation reuse is supplemental irrigation
 - Irrigation with reclaimed water in addition to and in combination with rainfall, meets water demands of the irrigated vegetation to maximize production or optimize growth
- Supplemental irrigation vs. land treatment
 - Supplemental irrigation - strictly reuse
 - Land treatment - primarily treatment and disposal, secondarily planned or unplanned reuse (SCAT Regulations, 9 VAC 25-790)

Water Reclamation and Reuse Regulation

**Nutrient management plan (NMP)
requirements for irrigation reuse determined
by:**

- **Total N and total P content of reclaimed water (BNR used as threshold)**
- **Bulk vs. non-bulk irrigation**
- **Certain bulk irrigation independent of reclaimed water nutrient content**

Water Reclamation and Reuse Regulation

BNR (Biological Nutrient Removal) – treatment which achieves an annual average concentration of 8 mg/l total N and 1 mg/l total P

- BNR reclaimed water - \leq BNR
- Non-BNR reclaimed water - $>$ BNR

Bulk irrigation reuse – reuse of reclaimed water for irrigation of an area > 5 acres on one contiguous property

Non-bulk irrigation reuse – reuse of reclaimed water for irrigation of an individual area ≤ 5 acres

Water Reclamation and Reuse Regulation

No NMP Requirements for:

- **Bulk irrigation reuse with BNR reclaimed water (one exception)**
- **Any non-bulk irrigation reuse independent of reclaimed water nutrient content**
 - **For Non-bulk irrigation reuse with non-BNR reclaimed water, RWM plan must describe other measures to manage nutrients**

Water Reclamation and Reuse Regulation

Other measures in lieu of NMP for non-bulk irrigation reuse of non-BNR reclaimed water:

- **Language in service agreement or contract explaining proper use of reclaimed water**
- **Distribution of literature annually or more often explaining proper use of reclaimed water**
- **Reclaimed water metering of individual non-bulk irrigation end users**
- **Monthly monitoring of N & P loads by non-bulk irrigation reuse to service area**

Water Reclamation and Reuse Regulation

NMP Requirements for:

- **Bulk irrigation reuse with non-BNR reclaimed water**
- **Bulk irrigation reuse independent of reclaimed water nutrient content where:**
 - **WWTF, reclamation system, satellite reclamation system or reclaimed water distribution system and irrigation reuse site are under common ownership or management, and**
 - **In addition to irrigation reuse:**
 - **No option to dispose via permitted discharge, or**
 - **Option to dispose via permitted discharge but VPDES permit does not allow discharge of full nutrient load**

Water Reclamation and Reuse Regulation

Accounting required for nutrient losses transferred from a point source to a non-point source via reclaimed water reuse. Applies when:

- WWTF required to have General VPDES Watershed Permit (9 VAC 25-280) and provides source water for reclamation and reuse, and
- The reuse will be:
 - Bulk irrigation requiring a NMP – 15% annual N load & 10% annual P load considered lost to state waters to be reported as discharged total N and total P by WWTF
 - Non-bulk irrigation with non-BNR reclaimed water – 30% annual N load & 20% annual P load considered lost to state waters to be reported as discharged total N and total P by WWTF

Water Reclamation and Reuse Regulation

Site plans - for all bulk irrigation reuse sites on USGS topo maps showing:

- Boundaries of irrigation sites
- Location of the following within 250' of irrigation site:
 - All potable and non-potable water supply wells and springs, and water supply intakes
 - Occupied dwellings and property lines
 - Areas accessible to public
 - Outdoor eating, drinking and bathing facilities
 - Surface waters, including wetlands
 - Limestone rock outcrops and sinkholes
- Setback areas around irrigation site

Water Reclamation and Reuse Regulation

9 VAC 25-740-170 Use area requirements

- **Education and notification program (Level 1 reclaimed water only)**
- **General requirements for all irrigation reuses of reclaimed water**
- **General requirements for bulk irrigation reuses of reclaimed water**
- **Setbacks distances for irrigation reuse – specific to Level 1 and Level 2 reclaimed water**
- **Setback distances for other reuses (i.e., indoor aesthetic features and open cooling towers)**

Water Reclamation and Reuse Regulation

Setback distances for irrigation reuses of Level 1 reclaimed water

- **100' – Potable water supply wells and springs, and public water supply intakes**
- **10' – Non-potable water supply wells**
- **50' – Limestone rock outcrops and sinkholes**
- **Aerosol formation must be minimized from irrigation within 100' of occupied dwellings and outdoor eating, drinking and bathing facilities**

Water Reclamation and Reuse Regulation

Setback distances for irrigation reuses of Level 2 reclaimed water

- **200' – Potable water supply wells and springs, and public water supply intakes**
- **10' – Non-potable water supply wells**
- **50' – Surface waters, including wetlands**
- **200' – Occupied dwellings**
- **100' – Property Lines and areas accessible to public**
- **50' – Limestone rock outcrops and sinkholes**
- **Options to reduce most setbacks are available**

Water Reclamation and Reuse Regulation

9 VAC 25-740-200 Reporting

- **Generators of reclaimed water will have monthly reporting requirements to demonstrate compliance with permit**
- **Distributors or providers of reclaimed water will have annual reporting requirements**
 - **Summary of ongoing education and notification program activities (Level 1 only)**
 - **Monthly total volumes of reclaimed water delivered to service area for 12-month period**
 - **For irrigation reuses of non-BNR reclaimed water – monthly total volumes of reclaimed water used, monthly total N & P loads, and active area in irrigation reuse – all for 12-month period**

Water Reclamation and Reuse Regulation

Anticipated Timeline for Adoption

- **Publish draft regulation for public comment in late May or early June – public hearings will be held during comment period of 60+ days**
- **Revise regulation based on public comments**
- **Take final regulation to the State Water Control Board in September 2007 for approval**
- **After Executive Branch review and approval publish final regulation for 30 days**
- **Adoption of final regulation anticipated before the end of 2007**

Questions?

Water Reclamation and Reuse Regulation

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